Claims

I claim:

[c1] A fastener comprising;

a) a plate having

i) a substantially planar lower surface,

ii) an upper surface opposing said lower surface,

b) a cavity extending from the upper surface downward toward the lower surface of said plate for receiving in mated engagement a non-circular portion of a bolt selected from the group consisting of a bolt head and a nut,

c) a circular bore extending upward from said lower surface to penetrate a portion of said central cavity, being co-axially disposed thereto such that the non-circular portion of a bolt is retained in said cavity with the shaft of the bolt extending through said circular bore.

[c2] A fastener according to claim 1 further comprising means to secure the fastener to an object in contact with the lower surface thereby preventing rotation about the circular bore.

[c3] A fastener according to claim 1 further comprising a hole extending between the upper and lower surface disposed between the edge of the fastener and the central bore to secure the fastener to an object in contact with the lower surface thereby preventing rotation about said circular bore.

[c4] A fastener according to claim 1 further comprising a plurality of holes spaced about the periphery of the circular bore between the edge of the fastener and said cavity.

[c5] A fastener according to claim 1 wherein the periphery of the fastener is thinner than the portion of the fastener adjacent said cavity.

[c6] A fastener according to claim 4 wherein the fastener is thinner in regions circumscribing each of said holes than in the region adjacent said cavity.

[c7] A fastener according to claim 6 wherein the thinner peripheral regions around each hole are separated by a plurality of ribs.

[c8] A fastener according to claim 7 wherein the ribs taper in thickness from the portion of the fastener adjacent to said cavity toward the thinner peripheral region adjacent each hole.

[c9] A fastener according to claim 1 wherein said cavity has a polygonal shape with three or more sides.

[c10] A fastener according to claim 9 wherein the polygonal shape has four or more sides.

[c11] A fastener according to claim 7 wherein the polygonal shape has five or more sides.

[c12] A fastener according to claim 9 wherein the polygonal shape has six sides.

[c13] A fastener according to claim 1 further comprising a member having a linear edge with the substantially planar lower surface and extending orthogonally outward there from.

[c14] A fastening system comprising;

a) A bolt comprising a threaded shaft terminated by a non- circular head,

b) an substantially annular shaped member disposed on the threaded shaft, said annular shaped member having a bottom planar surface oriented toward the threaded shaft such that the non-circular head engages a mating cavity formed on the top side of the annular shaped member,

c) a nut disposed on the threaded shaft to grasp one or more objects or structures disposed between the nut and bottom planar surface of said annular shaped member,

d) whereby the securing of said annular shaped member to the object to precludes axial rotation about the threaded shaft and prevents the non-circular head from rotating as the nut is advanced along the threaded shaft to secure the object.

[c15] A fastening system according to claim 14 wherein the annular shaped member has one or more holes between the annular hole and the edge for receiving the shaft of a securing fastener therein.

[c16] A fastening system comprising:

a) A bolt comprising a threaded shaft terminated by a non- circular head,

b) A mating nut disposed about the threaded shaft,

c) A annular shaped member disposed on the threaded shaft, the annular shaped member having a bottom planar surface disposed toward the non circular head, the top surface of the annular shaped member comprises a cavity for receiving the nut such that turning the nut to advance it toward the non-circular head also rotates the annular shaped member urging it toward the non-circular head to grasp one or more objects or structured disposed between the non-circular head and the bottom planar surface of the annular shaped member,

d) whereby securing the annular shaped member to the object precludes axial rotation about the threaded shaft also prevents the nut from reversing direction to either loosen the grip on the object or unthread from the shaft.

[c17] A method of fastening a first structure to a second structure, the method comprising:

a) providing one or more holes that traverse an overlapping area of the structures to receive a cylindrical shaft, the shaft having a threaded end and a non-circular bolt end,

b) placing a fastener on the shaft, the fastener having a flat face disposed toward the threaded end of the shaft, and an opposing face which includes a cavity for receiving in mating attachment the non-circular bolt end,

c) inserting the shaft through the hole such that the flat face of the fastener is adjacent the outer surface of the first structure with the threaded end extending to protrude from the second structure,

d) securing the fastener to the first structure to prevent rotation about the shaft,

e) inserting an annular component having at least one flat face onto the threaded shaft the flat face disposed toward the second structure,

f) threading a nut onto the shaft as the non-circular head locks into the cavity to prevent rotation of the threaded bolt,

g) rotating the nut to advance it toward the fastener to urge the flat face of the annular component against the second structure, such that both the annular component and the fastener grasp and compress the first and second structure.